Implications of Multiple Intelligences and Visual, Auditory, Kinesthetic Learning Preference

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Abstract

This qualitative study refutes cognitive assessment instruments as definitive measures of human intelligence. Howard Gardner's theory of multiple intelligences (MI) is found to agitate the conventional wisdom concerning the appraisal of human intellectual proclivity. Though Gardner's theory is defended as a more comprehensive, assessment methodology; limitations to multiple intelligence theory are elucidated. Visual/Auditory/Kinesthetic (VAK) Learning Modality is correlated as an appropriate model for evaluating multiple intelligence theory due to its multi-sensory foci. The resultant analysis reveals objective correlation between MI and VAK to be consternated by variables such as culture and self-bias; however, the research advances the discussion as to how to more efficiently and effectively increase learner achievement and outcomes.

In theory, understanding multiple intelligences enables humans to grasp more comprehensively who they are and of what are they capable, assists learners in more efficiently gathering information through manipulating their natural learning preferences, and leads individuals to a clarity of classification systems where no category blurs into the definition of the next. In practice, such concepts are difficult to measure and quantify, classification systems are imperfect, and learners cannot always augment their efficiency in learning. The theory of multiple intelligences and learning styles correlate subjectively. Like the concept of intelligence, the theory of multiple intelligences and visual, auditory, and kinesthetic learning preferences are riddled with ambiguity. However, while being no stranger to limitations, such theories do advance the discussions of what intelligence is and how a learner may more efficiently learn.

The concept of intelligence, as is known to humans, or for that matter, not known, seems to vaguely acknowledge the appraisal of the capabilities and limitations of organisms. According to Riding and Pearson "there is considerable difficulty with its definition and scope" (1994, p. 413). Sternberg, who postulated the triarchic theory of human intelligence, argued that intelligence is a "mental activity directed toward purposive adaptation to, and selection and shaping of, real-world environments relevant to one's life" (Sternberg, 1985, p. 45). While Sternberg offered a definition for intelligence, he ceded that in studying the nascent field "none of the currently available explicit theories seem to do justice to the full scope of intelligence, broadly defined" (1985, p. 39). Sternberg (1985) even went so far as to say that "there just does not exist a single approach that answers or even addresses all of the questions one would want answered about the nature of intelligence" (p. 343).

Perhaps chief among such questions, scholars grappled with answering how to assess what seemed so enigmatic and intangible to define (Riding & Pearson, 1994; Sternberg, 1985).

Little is known concerning when intelligence was first informally assessed. Perhaps the primordial humans, or even the animals predating them, first sought to quantify the value of what peers could contribute. As for formal assessment, Naglieri and Goldstein acknowledged Stanford and Binet as most likely introducing the first intelligence test in the early twentieth century (2009). Yet such formal assessment, for all its grandeur made possible by over a hundred years of research, modifications, and fail-safes, still fails to win minds, primarily, concerning if, and how the mind is testable.

Serving as the apotheosis of formal assessment, the intelligence quotient (IQ) makes the case against unanimity among scholars questing to measure intelligence. According to Eysenck;

> The term IQ was derived from an actual quotient: mental age divided by chronological age, usually multiplied by 100 to get rid of decimal points; [where] mental age in this quotient represented the age level which was represented by an individual child's actual performance, irrespective of his actual (chronological) age (1971, p.44).

IQ, though a formal assessment mainstay, is beyond a cursory glance, still rather superficial. According to Kaufman "IQ tests (even the most accurate and reliable tests) contain errors of measurement, and different tests yield different IQs for the same person; so do different examiners; and so do different IQ scales within the same test" (2009, p. 8). To illustrate how scaling is skewed, take for example a six-year-old child who tests at a seven-year-old level. The testing participant would be deemed to have an IQ of 116. This score would indicate above average intelligence, as normal intelligence is between 90 and 110; and less than half a percent purportedly possess scores "below 60, or higher than 140" (Eysenck, 1971, p. 44). Similarly if a fourteen-year-old also tested one-year above his or her chronological age, results would indicate that the adolescent would still be above average, but with an IQ of only 107. While there is

obvious scoring disparity for the younger testing participant, each additional chronological year is in theory supposed to make for a more accurate IQ score. According to Murdoch "IQ scores generally don't 'settle' until children are in adolescence" (2007, p. 7). Yet the order and sanity of "settling" afforded by mathematics inevitably comes to an end. According to Eysenck after the chronological age of sixteen, calculations become irrelevant for evaluating the IQ of individuals (1971). Thus, an examiner can no longer divide a mental age by a chronological age and multiply by 100 for a participant who is seventeen or more years of age. Subsequently, older participants undergoing IQ testing require benchmarking. To add insult to inaccuracy, participants, at best, can be compared against only a small sample of the global adult population that has previously been tested in order for a quotient … or perhaps more accurately … an intelligence score, to be determined by examiners. To further add inaccuracy to inaccuracy, multiple tests, divergent as they are, claim to perform this feat successfully.

While the definition, even the assessment of intelligence remains suspect, Howard Gardner further agitated the discussion through postulating the theory of multiple intelligences in *Frames of Mind* (1983). Gardner asserted:

> In a traditional view, intelligence is defined operationally as the ability to answer items on tests …. Multiple intelligences theory, on the other hand, pluralizes the traditional concept. An intelligence entails the ability to solve problems or fashion products that are of consequence in a particular cultural setting or community (1993, p. 15).

Gardner argued that intelligence is not a singular phenomenon but rather a collection of seven distinct intelligences within every individual: linguistic, logical-mathematical, spatial, bodily-kinesthetic, interpersonal, intrapersonal, and musical (Gardner, 1983). In effect, "Gardner's theories….wrest the word "intelligence" from mainstream psychologists and

elasticize the concept" (Murdoch, 2007, p. 185). While some intelligences may be more prevalent than others, an individual can concurrently possess each to a varying extent and proficiency. Moreover, through *Frames of Mind,* Gardner contributed anew to the intelligence conversation the value of communicating with others as well as personal reflection (1983). According to Ellison "Gardner, for the first time, defined personal intelligences—Intrapersonal Intelligence, the development of internal aspects of 'one's own feeling life,' and Interpersonal Intelligence, 'the ability to notice and make distinctions among other individuals'" (2001, p. 15).

Though Gardner sought to recognize the diverse capabilities of each individual in an unprecedented comprehensive manner, the theory of multiple intelligences met considerable criticism. Gardner, despite creativity, even revolutionary brilliance in theorizing the intelligences, failed to offer an assessment instrument that could quantify the various intelligences. As Murdoch offered "while many academic psychologists personally admire Gardner….the majority reject his work….Academics also critically point out that Gardner hasn't written a test" (2007, p. 184).

In Gardner's defense, crafting such an assessment instrument presumes at least two relevant prerequisite assumptions. The first assumption would be that all intelligences are quantifiable. And the second is that experts within the field will agree upon how best to measure quantifiable intelligences. In regards to the first, scholars do not unanimously agree which intelligences are measurable (Stefanakis, 2002; Murdoch, 2007; Kaufman, 2009). Murdoch, more conservatively, reasons what has traditionally been tested (i.e., linguistic and mathematical-logical intelligences) reflects all that is truly measurable (2007). Kaufman has conceded that in addition to linguistic and mathematical-logical intelligences, spatial intelligence is also quantifiable (2009). However, Kaufman has gone so far as to have contended that "IQ tests do

not measure Gardner's other….intelligences, many of which are noncognitive: musical, bodily-kinesthetic, naturalistic, interpersonal, and intrapersonal (i.e., self insight)" (2009, p. 57). In contrast to the notion that limitations exist concerning which multiple intelligences are measurable, other scholars appear more supportive of Gardner's reasoning that the capabilities of individuals are more comprehensive than traditional tests have historically accommodated. For example, Ellison has offered "the multiple intelligence model" values "visual thinking, music, dance, and movement" (2001, p.15). In regards to the latter prerequisite assumption concerning how to measure multiple intelligences most effectively, a given assessment instrument will inherently be flawed. To illustrate an example of why this is so, Stefanakis has argued "only a small percentage of students in diverse populations have the defined English language skills and academic vocabulary to score well even though they may have adequate linguistic intelligence" (2002, p. 145). In theory, even with a perfect assessment instrument for certain participants, individuals that should not have been tested with it (i.e., linguistic assessment for nonnative speakers) will skew the true intelligence score for the population at-large.

To recap, not all scholars agree what multiple intelligences are assessable, and even where there may be common ground concerning what intelligences are measurable, how to accurately perform assessment is unclear and diffuse. In spite of the multiple limitations to the theory of multiple intelligences, Gardner may prove his own worst critic as he had cautioned, "I want to underscore that the notion of multiple intelligences is hardly a proven scientific fact; it is, at most, an idea….it is inevitable that this idea will harbor many shortcomings" (1985, p. 11).

Though the theory of multiple intelligences harbors shortcomings, the question remains whether intelligences can be educationally cultivated. On a fundamental level, concerning intelligence in general, there has always been the question "is it genetically acquired

or is it nurtured in environments" (Lapan & Haughton, 1995, p. 11). In a study of forty-one schools across the United States, slightly less than half of the respondents found teaching to multiple intelligences to positively impact standardized test scores (Kornhaber, Garcia Fierros, & Veenema, 2004). Furthermore, nearly one-third of respondents that experienced improved standardized test scores declined to correlate such improvement to any initiative geared toward teaching to the multiple intelligences (Kornhaber et al., 2004). While the sample size is limited, the study illustrates that teaching to multiple intelligences does not necessarily appeal or resonate with respondent practitioners as an indispensable prerequisite for educational success. In fairness, perhaps multiple intelligences may fail to form lasting impressions on the majority of educational systems not due to the limitations of the theory, but because the school may be prioritized and valued over the individual learner. As Murdoch reasoned "ultimately, testing a singular, rankable, intelligence is about institutional efficiency, and Howard Gardner's multiple intelligences is not" (2007, p. 184-185).

In order to use the theory of multiple intelligences to teach learners, it is imperative to choose a learning style instrument that will, through implementation, provide an avenue to observe the development of individual intelligences. Gardner envisioned, "in my view, it should be possible to identify an individual's intellectual profile (or proclivities) at an early age and then draw upon this knowledge to enhance that person's educational opportunities and options" (1985, p. 10). However, how to go about drawing upon the intelligences, even positively manipulate them, was not a problem for which Gardner posed a solution (Murdoch, 2007). Nonetheless, supposing Gardner's reasoning is valid, there should exist strategies to exploit and manipulate a learner's strengths and weaknesses to a desired end. As Riding and Pearson offered "strategies are ways that may be learned and developed to cope with situations and tasks, and

particularly methods of utilizing styles to make the best of situations for which they are not ideally suited" (1994, p. 423). Regardless if such strategies would be of the exclusive task of the teacher or learner, regardless of the age of the learner, and regardless of the particular intelligence to be developed, enhancement should be possible (Gardner, 1983; Riding & Pearson, 1994).

In a concerted effort to identify strategies to support the development of the multiple intelligences of a given learner, an appropriate learning style assessment is necessitated; the Visual/Auditory/Kinesthetic (VAK) model is suitable for the theory of multiple intelligences for several reasons. First the framework, through lacking a defined origin, represents an amalgam of years experienced by countless instructors and learners in journeying to discover how student learning preference affects learning outcomes (Barsch, 1980; Rayner & Cools, 2011). Second, the nature of the model is inclusive; VAK provides an avenue to exploit opportunities for embracing the various intelligences more comprehensively. This feature is imperative as Stefanakis noted, "Gardner's work encourages educators and parents to gather additional information on individuals to better understand and use a wider array of students' capabilities" (2002, p. 4). Another major benefit of the VAK model is its similarity to multiple intelligences theory since both recognize multi-sensory competency. For instance, a propensity or inclination for interpersonal intelligence would likely incorporate visually observing nonverbal behavior, listening to verbal messages, and kinesthetically exhibiting appropriate communication (Gardner, 1983). Concurrently, the VAK framework, through the very nature of learner preference being a combination of visual, auditory, and/or kinesthetic modalities, can absorb and digest the multisensory interpersonal intelligence concept as a learner activity that features preferences for verbal, auditory, and kinesthetic behavior.

However, VAK is not without criticism. In order to identify VAK learner preferences, self-questionnaires are often utilized (Barsch, 1980). Such assessments may prove inaccurate due to user-bias. According to a study conducted by Krätzig and Arbuthnott, testing learning styles proved difficult "because participants simply stated their beliefs about what they were good and not so good at without reference to any evidence for those beliefs" (2006, p. 204). User-bias seems to be reflective in another study that concluded, "there is growing evidence that people hold beliefs about how they learn that are faulty in various ways, which frequently lead people to manage their own learning and teach others in nonoptimal ways" (Pashler, McDaniel, Rohrer, & Bjork, 2009). Moreover, what may be considered a learning proficiency in one culture may be a deficiency in the next (Riding & Pearson, 1994). For instance, one culture may value the kinesthetic ability of an individual, such as playing a particular sport exceptionally, more than another. Furthermore, research has indicated that refocusing on a learner's propensity to develop through visual, auditory, or kinesthetic means is not always successful for all learners. According to Dunn and Dunn, "confusing reports of successes and only limited successes for students with varied perceptual strengths suggest that combined auditory, visual,….and/or kinesthetic instructional resources—is not necessarily beneficial for all students" (2005, p. 276).

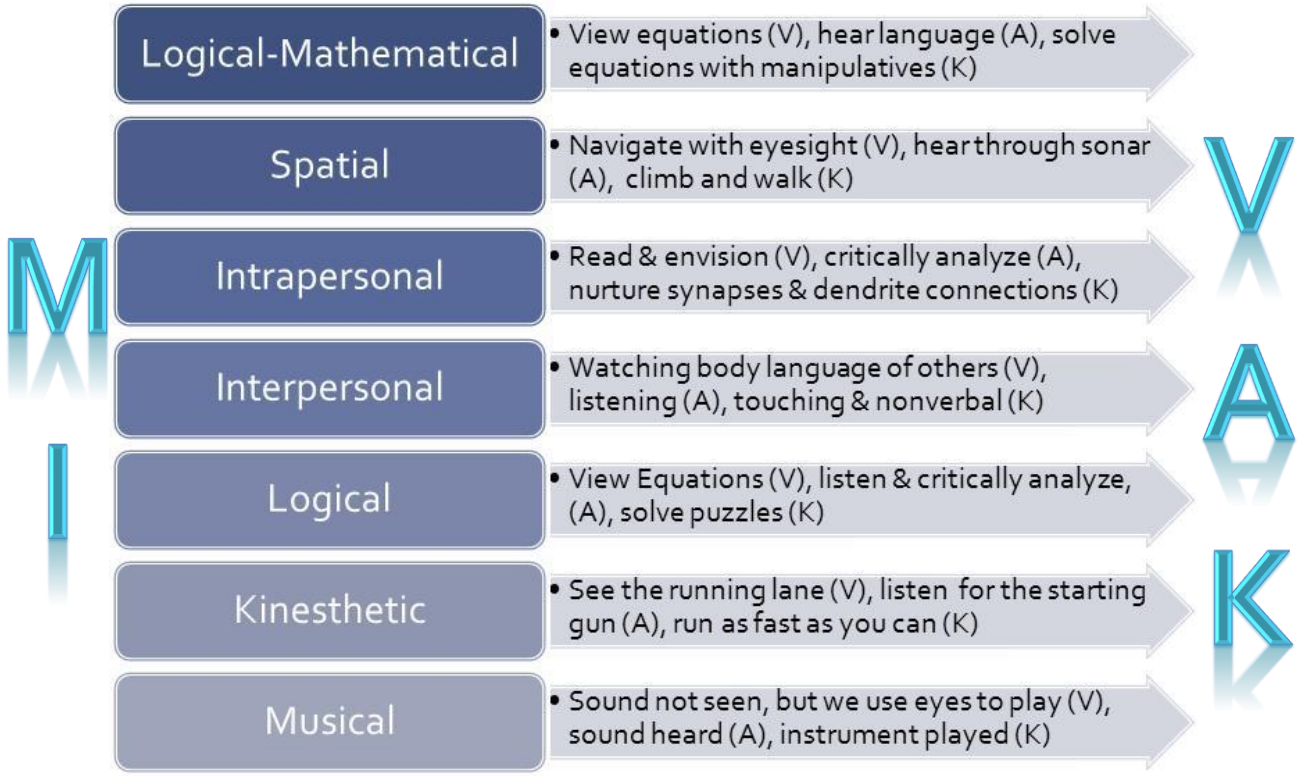
Conclusive research is lacking concerning how Gardner's multiple intelligences empirically correlate with visual, auditory, and kinesthetic learning preferences. Moreover, superseding which multiple intelligences fit, shoe and foot, with each learning style, is the perspective that certain intelligences are not capable of being tested in the first place (Stefanakis, 2002; Murdoch, 2007; Kaufman, 2009). Subsequently, an effort seeking to definitively associate learning preferences with multiple intelligences raises the question of the universality of a given interpretation; a question that bevels a degree of subjectivity in its answering (see Appendix I).

For instance, in regards to intrapersonal intelligence, should being meta-cognizant of dendrite connections that could occur through self-reflection count as a kinesthetic activity? Should a new pianist that learns to make sound by viewing the striking of piano keys of his or her teacher count as a visual preference for musical intelligence? Or even, in regards to bodily-kinesthetic intelligence, should the learning of physical movements to a choreographed dance qualify as an auditory preference, if a learner best remembers which moves to execute based on the particular part of a piece of music? On one end of the spectrum, some might evaluate such correlations as too farfetched; and on the other, some might argue why not allow the flexibility of interpretation, after all, it's not like a universal definition of intelligence has been agreed upon anyway.

Appendix I

The following chart was created by Paul Conlon as a practical exercise to implement the theory of multiple intelligences in consideration of the VAK framework. Upon completion of this exercise, it was determined that associating each learning style to every multiple intelligence is a rather subjective endeavor that requires correlations that are perhaps too implausible.

Figure 1 Correlation of Gardner's Multiple Intelligences with the VAK Framework



Appendix II

The following is an excerpt from an actual lesson plan conducted by Paul Conlon in November, 2011 in which high school students were given, through various activities, an opportunity to learn material through visual, auditory, and kinesthetic learning centers. Following an initial lecture component, students rotated to three centers for ten-minute increments. Each learning center consisted of approximately four to six students, and each student only experienced each learning center once within the instructional period. This lesson was taught for four classes on a given day to approximately 145 students cumulatively. Students were not made aware of the significance of each center as being designed to achieve a given learning modality. While no formal assessment was created to gauge the retention of academic material, qualitative results from the experiment seemed to indicate many students welcomed the inclusion of kinesthetic activity within the instructional period. Subsequently, the perception of an increased level of student engagement was observable. Credit should be given to McCutcheon (2001), author of the textbook and ancillary resources, to which the content of this lesson has been adapted (see references). Learning center one is primarily kinesthetic, learning center two is primarily auditory, and learning center three is primarily visual. Each learning center is imperfect in that it may welcome multi-sensory experiences.

Learning Center 1 Directions: The goal of this assignment is to portray aggressive, nonassertive, and assertive tones in a real life situation. Role play (yes act!) the following characters through creating aggressive, nonassertive, and assertive tone. Remember to be appropriate and keep volume down in consideration of other learning centers.

CHARACTERS: Hiring Manager & Job Seeker

You are a hiring manager at _____ company. Take turns being both the interviewer and interviewee. Practice these roles each in aggressive, nonassertive, and assertive tones.

Learning Center 2 Directions: In your small group, read the following list to a fellow classmate. Don't let the classmate see the list you are reading from. After reading the list, listeners should try to repeat back the main points to the reader. Take turns.

"The 4 ABC's are: 1) Always Be Clear, 2) Always Be Complete, 3) Always Be Concise, and 4) Always Be Considerate" (McCutcheon, 2001).

Learning Center 3 Directions: As a group, draw three quick sketches. One sketch should be a conversation with an assertive tone, another should be a conversation with a nonassertive tone, while the last should be a conversation with a tone that is aggressive. Write speech balloons and have each character say at least one thing to the other. For example:

Appendix III

The following heuristic exercise was created by Conlon in an effort to appreciate the difficulty in concocting the development of a learning style self-reflection questionnaire. Suggested interpretations are listed upon a slide which is meant to be seen by the participant succeeding the conclusion of the participant reading the passage. Suggested interpretations mean to imply, though potentially erroneously, various learning preference inclinations. No empirical data exists to suggest the validity of the assessment instrument. The visual learner may see the passage in pictures. Perhaps the visual learner may see the astronauts orbit Mars through the shuttle window. The auditory learner may "hear" the voice of a narrator (though obviously no sound is made) as if being told a story. The kinesthetic learner may hear his or her inner voice narrate the story, or perhaps even imagine being in Martian orbit preparing to reinitiate the NASA rover on Mars in mere hours (assuming the crew safely makes the first human landing).

Directions: Please read the following passage.

"The last leg of the journey was upon them. The amber hues of Mars, offset the distance from their families, a distance not even the vastness of space could do justice. In three hours, the crew would plummet faster than death ever tempted mankind toward Spirit. In seven, Spirit would be brought back to life. They disengaged, and prepared to make the most dangerous final descent ever known. Exhausting, unrelenting anxiety violating them, they peered through the window, somewhere near the thought of death, and watched her glisten, so large, she redefined the Sun, she redefined beauty." - Conlon

Question 1 In your head, what voice did you hear read this?
Question 2 When you read, was it your voice you heard or that of someone else?
Question 3 If you did not hear a voice, did you imagine pictures?

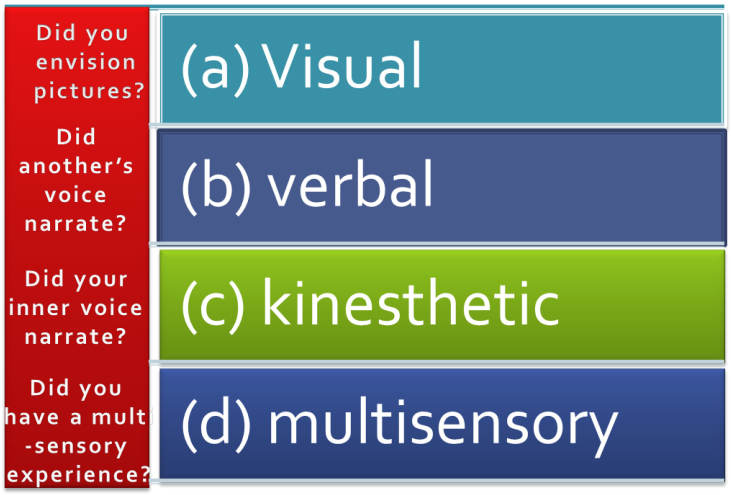


Figure 2 VAK Framework Tailored to Reading Passage Interpretations

References

Barsch, J. (1980). Community College: New Opportunities for the LD Student. *Intervention in School and Clinic*, *15*, 467-470. doi:10.1177/105345128001500409

Dunn, R., & Dunn, K. (2005). Thirty-five Years of Research on Perceptual Strengths: Essential Strategies to Promote Learning. *The Clearing House*, *78*(6), 273-276.

Ellison, L. (2001). *The personal intelligences : promoting social and emotional learning*. Thousand Oaks Calif.: Corwin Press.

Eysenck, H. (1971). *The IQ argument: race, intelligence, and education,*. New York: Library Press.

Gardner, H. (1983). *Frames of mind*. New York: Basic Books.

Gardner, H. (1993). *Multiple intelligences : the theory in practice* (20th ed.). New York NY: Basic Books.

Kaufman, A. (2009). *IQ testing 101*. New York NY: Springer Pub. Co.

Kornhaber, M., Garcia Fierros, E., & Veenema, S. (2004). *Multiple intelligences : best ideas from theory and practice*. Boston Mass. [u.a.]: Pearson A and B.

Krätzig, G. P., & Arbuthnott, K. D. (2006). Perceptual Learning Style and Learning Proficiency: A Test of the Hypothesis. *Journal of Educational Psychology*, *98*, 238-246. doi:10.1037/0022-0663.98.1.238

Lapan, M., & Houghton, R. (1995). *Learning and intelligence : conversations with Skinner and Wheeler*. Dublin Ireland ;;Portland OR: Irish Academic Press.

McCutcheon, R. (2001). *Communication applications*. Lincolnwood Ill.: National Textbook Co.

Murdoch, S. (2007). *IQ a smart history of a failed idea*. Princeton, N.J. :: Recording for the Blind & Dyslexic.

Naglieri, J., & Goldstein, S. (2009). *Practitioner's guide to assessing intelligence and achievement*. Hoboken N.J.: Wiley.

Pashler, H., McDaniel, M., Rohrer, D., & Bjork, R. (2009). Learning Styles: Concepts and Evidence. *Psychological Science in the Public Interest*, *9*, 105-119. doi:10.1111/j.1539-6053.2009.01038.x

Rayner, S., & Cools, E. (2011). *Style differences in cognition, learning, and management : theory, research, and practice*. New York: Routledge.

Riding, R. J., & Pearson, F. (1994). The Relationship between Cognitive Style and Intelligence. *Educational Psychology*, *14*, 413-425. doi:10.1080/0144341940140404

Stefanakis, E. (2002). *Multiple intelligences and portfolios : a window into the learner's mind*. Portsmouth NH: Heinemann.

Sternberg, R. (1985). *Beyond IQ : a triarchic theory of human intelligence*. Cambridge [Cambridgeshire] ;New York: Cambridge University Press.